CLAIMS:

1. Electro-acoustic resonator (1, 8, 17) with a layer structure comprising a piezoelectric layer (5, 14, 24) and a top (6, 15, 25) and a bottom (4, 13, 23) electrode layer, with the thickness (T1, T2, ...T6) of the two electrode layers being unequal, characterised in that the top electrode layer (T1, T3, T5) is thinner than the bottom (T2, T4, T6) electrode layer.

2. Electro-acoustic resonator (1, 8, 17) as claimed in claim 1, characterised in that the electro-acoustic resonator (1, 8, 17) is a solidly-mounted resonator or SBAR (8,17) or that it has a membrane structure FBAR (1).

3. Electro-acoustic resonator (1, 8, 17) as claimed in one of the foregoing claims, characterised in that at least one of the electrode layers (25, 26 or 22, 23) is formed by a stack of conductive materials.

4. Electro-acoustic resonator (1, 8, 17) as claimed in one of the foregoing claims, characterised in that between the electrode layers 22 and 23 and /or 25 and 26 a conductive thin diffusion barrier is formed.

5. Electro-acoustic resonator (1, 8, 17) as claimed in claim 3, characterised in that in the stack the conductive material (23, 25) that is in contact with the piezoelectric layer (24) has a higher acoustic impedance than the conductive material (22, 26) that is not in contact with the piezoelectric layer (24).

6. Electro-acoustic resonator (1, 8, 17) as claimed in claim 3, characterised in that in the stack the conductive material (23, 25) in contact with the piezoelectric

layer (24) has a lower acoustic impedance than the conductive material (22, 26) that is not in contact with the piezoelectric layer (24).

7. Electro-acoustic (1, 8, 17) resonator as claimed in claim 5 or 6, characterised in that the conductive material with the lower acoustic impedance comprises Aluminium (Al).

8. Electro-acoustic resonator (1, 8, 17) as claimed in claim 5 or 6, characterised in that the conductive material with the higher acoustic impedance comprises platinum (Pt), wolfram (W), molybdenum (Mo), titan-wolfram (Ti_xW_{1-x}, $0<x<1$), Gold (Au).

9. Electro-acoustic resonator (1, 8, 17) as claimed in claim 5 or 6, characterised in that the diffusion barrier between the electrode layers 22 and 23 and /or between the electrodes 25 and 26 consists of titanium nitride (TiN), or titanium (Ti), or consists of comminations of titanium nitride (TiN) and titanium (Ti).

10. Electro-acoustic resonator (1, 8, 17) as claimed in one of the foregoing claims, characterised in that the electrode layers (4, 6, 13, 15, 23, 25) comprise Molybdenum (Mo) and that, for a resonant frequency in the region of 2 GHz, the thickness (T1, T3, T5) of the top Molybdenum layer (6, 15,25) is in the region of 200 nm and the thickness (T2, T4, T6) of the bottom Molybdenum layer (4, 13, 23) is in the region of 300 nm, these thicknesses scaling approximately inversely with resonant frequency.

11. Electro-acoustic resonator (1, 8, 17) as claimed in one of the foregoing claims, characterised in that the electrode layers (4, 6, 13, 15, 23, 25) comprise platinum (Pt) and that, for a resonant frequency in the region of 2 GHz, the thickness (T1, T3, T5) of the top platinum layer (6, 15,25) is in the region of 50 nm and the thickness (T2, T4, T6) of the bottom platinum layer (4, 13, 23) is in the

region of 150 nm, these thicknesses scaling approximately inversely with resonant frequency.

12. Use of an electro-acoustic resonator (1, 8, 17), especially an electro-acoustic resonator as claimed in claim 1, as a component of a radio frequency (RF) filter, or as a component used in a sensor, or used in an ultrasonic transducer, or used in an array of ultrasonic transducers.